

Application Serial No. 09/696,519

1. (Currently Amended) In a process for manufacture of tufted carpets comprising steps that comprise adhering to a stitched side of a tufted primary backing a plurality of stitches of face yarn comprising a plurality of filaments by applying a thermoplastic binder comprising a softened or melted thermoplastic resin into contact with the stitched side by (a) extruding the binder with melted thermoplastic resin into contact with the stitched side or (b) heating the binder applied or present in solid form in contact with the stitched side to soften or melt the thermoplastic resin, and cooling the thermoplastic binder in contact with the stitched side to solidify the resin, the improvement wherein the thermoplastic binder consists entirely or essentially of a thermoplastic polyethylene, ~~polypropylene or ethylene-propylene copolymer resin or combination thereof~~ having flow properties at ~~about 100 to about 150°C~~ corresponding to an MI of about 2.2 to about ~~150~~ 105 g/10 min. as measured in accordance with ASTM D 1238; and a viscosity between approximately 230,000 and 4,881,000 cps at about 270°F with a shear rate of about 10 sec⁻¹ as measured in accordance with ASTM D 3835, and comprising steps that comprise applying to a plurality of the stitches, before the resin solidifies, a stitch bind composition having a viscosity effective for coating or penetrating the stitches to contact the filaments thereof ranging from about 0.5 to 3000 cps and comprising an aqueous liquid component that boils or vaporizes at a temperature such that it can be removed by heating below a temperature at which the tufted backing is damaged by heat and an organic polymer component that bonds filaments of the stitches on removal of the aqueous liquid component, wherein the stitch bind composition is applied in an amount effective to provide about 0.2 to about 3 ounces of the organic polymer component or a residue thereof per square yard of the stitched side; and, after applying the stitch bind composition but before the resin solidifies, heating the stitch bind composition to substantially remove the aqueous liquid component without damaging the tufted backing.
2. (Previously Presented) The process of claim 1 wherein the stitch bind composition is a solution, suspension or emulsion comprising the organic polymer component and the liquid component.

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3. (Previously Presented) The process of claim 1 wherein organic polymer content of the stitch bind composition is about 5 to about 60 wt% of the composition.
4. (Previously Presented) The process of claim 1 wherein the stitch bind composition has a viscosity of about 1 to 1200 cps.
5. (Previously Presented) The process of claim 1 wherein the softened or melted thermoplastic resin applied into contact with the stitched side of the tufted primary backing has flow properties corresponding to an MI of about 5 to about 100 g/10 min.
6. (Previously Presented) The process of claim 1 wherein the stitch bind composition is applied to the stitched side of the tufted backing as a spray.
7. (Previously Presented) The process of claim 1 wherein the stitch bind composition is applied to the stitched side of the tufted backing as a foam.
8. (Previously Presented) The process of claim 1 wherein the stitch bind composition is applied to the stitched side of the tufted backing as a froth.
9. (Previously Presented) The process of claim 1 wherein the tufted backing comprises a woven polypropylene fabric tufted with face yarn.
10. (Previously Presented) The process of claim 9 wherein the face yarn comprises nylon filaments.
11. (Previously Presented) The process of claim 9 wherein the face yarn comprises polyester filaments.
12. (Previously Presented) The process of claim 9 wherein the face yarn comprises polypropylene filaments.

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13. (Previously Presented) The process of claim 1 wherein the stitch bind composition has a viscosity of about 1.5 to 400 cps.

14. (Previously Presented) The process of claim 1 wherein the organic polymer component comprises a film-forming organic polymer.

15. (Previously Presented) The process of claim 1 wherein the organic polymer component comprises a thermoplastic polymer.

16. (Previously Presented) The process of claim 1 wherein the organic polymer component comprises a crosslinkable organic polymer.

17. (Previously Presented) The process of claim 16 wherein the stitch bind composition comprises a crosslinking agent for the organic polymer.

18. (Previously Presented) The process of claim 1 wherein the organic polymer component comprises an olefin-unsaturated acid, olefin-unsaturated acid ester or olefin-diene copolymer.

19. (Previously Presented) The process of claim 18 wherein the organic polymer component comprises an ethylene acrylic acid copolymer.

20. (Previously Presented) The process of claim 18 wherein the organic polymer component comprises a styrene acrylate copolymer.

21. (Previously Presented) The process of claim 18 wherein the organic polymer component comprises a carboxylated styrene butadiene copolymer.

22. (Previously Presented) The process of claim 1 wherein cooling the softened or melted resin in contact with the tufted backing is conducted with the softened or melted resin also in contact with an additional backing.

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23. (Currently Amended) A process for manufacture of carpets comprising the steps of providing a tufted backing having a stitched side that has a plurality of stitches of face yarn comprising filaments, wherein filaments of a plurality of the stitches are bonded with an organic polymer; contacting the stitched side of the tufted backing with a thermoplastic binder that consists entirely or essentially of a thermoplastic polyethylene, ~~polypropylene or ethylene-propylene copolymer resin or combination thereof~~ having flow properties ~~at about 100 to about 150°C~~ corresponding to an MI of about 2.2 to about ~~150~~ 105 g/10 min. as measured in accordance with ASTM D 1238; and a viscosity between approximately 230,000 and 4,881,000 cps at about 270°F with a shear rate of about 10 sec⁻¹ as measured in accordance with ASTM D 3835 and that softens or melts at a temperature below a temperature at which the tufted backing is damaged by heat or that, when softened or melted, can contact the tufted backing without such damage; heating the thermoplastic binder to soften or melt the resin without damaging the tufted backing; and cooling the backing with softened or melted resin in contact with the stitched side to solidify the resin.

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24. (Currently Amended) In a process for making carpets that comprises steps comprising:

providing a tufted backing comprising a backing and having a pile side and an opposite stitched side, wherein the pile side has a plurality of tufts of face yarn that comprise a plurality of filaments and the stitched side has a plurality of stitches of the face yarn;

contacting the stitched side of the tufted backing with a thermoplastic binder that comprises a thermoplastic resin that softens or melts at a temperature below a temperature at which the tufted backing is damaged by heat or that, when softened or melted, can contact the tufted backing without such damage, wherein the binder is applied into contact with the stitched side by (a) extruding the binder with melted thermoplastic resin into contact with the stitched side or (b) heating the binder applied or present in solid form as a film, fiber, fabric, particulates or combination thereof in contact with the stitched side to soften or melt the thermoplastic resin, without damaging the tufted backing; and

cooling the thermoplastic binder with the softened or melted resin thereof in contact with at least the stitched side of the tufted backing to solidify the thermoplastic resin;

the improvement wherein the thermoplastic binder consists entirely or essentially of a thermoplastic polyethylene, ~~polypropylene or ethylene propylene copolymer resin or combination thereof~~ having flow properties at about 100 to about 150°C corresponding to an MI of about 2.2 to about 150 105 g/10 min. as measured in accordance with ASTM D 1238; and a viscosity between approximately 230,000 and 4,881,000 cps at about 270°F with a shear rate of about 10 sec⁻¹ as measured in accordance with ASTM D 3835, and comprising steps that comprise:

applying to a plurality of stitches, before the softened or melted resin solidifies, a stitch bind composition that has a viscosity effective for coating or penetrating the stitches to contact the filaments thereof ranging from about 0.5 to 3000 cps and comprises an aqueous liquid component that boils or vaporizes at a temperature such that it can be removed by heating below a temperature at which the tufted backing is damaged by heat and an organic polymer component that bonds filaments of the stitches on removal of the

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aqueous liquid component, wherein the stitch bind composition is applied in an amount effective to provide about 0.2 to about 3 ounces of the organic polymer component or a residue thereof per square yard of the stitched side; and

after applying the stitch bind composition but before the softened or melted resin solidifies, heating the stitch bind composition to remove the aqueous liquid component without damaging the tufted backing.

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25. (Currently Amended) A process for making carpets comprising steps that comprise:

adhering to a stitched side of a tufted backing a plurality of stitches of face yarn comprising a plurality of filaments by cooling in contact with the stitched side a thermoplastic binder consisting entirely or essentially of a softened or melted thermoplastic polyethylene, ~~polypropylene or ethylene propylene copolymer resin or combination thereof~~ having flow properties ~~at about 100 to about 150°C~~ corresponding to an MI of about 2.2 to about 150 105 g/10 min. as measured in accordance with ASTM D 1238; and a viscosity between approximately 230,000 and 4,881,000 cps at about 270°F with a shear rate of about 10 sec⁻¹ as measured in accordance with ASTM D 3835 to solidify the resin, wherein the thermoplastic binder with the thermoplastic resin thereof in softened or melted form is contacted with the stitched side by heating the thermoplastic binder applied or present in solid form as a nonwoven fabric of continuous or staple fibers consisting entirely or essentially of the thermoplastic resin and having a weight of about 1 to about 15 ounces per square yard in contact with the stitched side to soften or melt the thermoplastic resin;

applying to a plurality of stitches, before the resin solidifies, a stitch bind composition having a viscosity effective for coating or penetrating the stitches to contact the filaments thereof ranging from about 0.5 to 3000 cps and comprising an aqueous liquid component that boils or vaporizes at a temperature such that it can be removed by heating below a temperature at which the tufted backing is damaged by heat and an organic polymer component that bonds filaments of the stitches on removal of the aqueous liquid component, wherein the stitch bind composition is applied in an amount effective to provide about 0.2 to about 3 ounces of the organic polymer component or a residue thereof per square yard of the stitched side; and

heating the stitch bind composition, after application thereof to the stitches and before the resin solidifies, to remove the aqueous liquid component of the stitch bind composition.

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26. (Currently Amended) A process for making a tufted carpet comprising steps that comprise

providing a tufted backing comprising a backing, face yarn comprising a plurality of filaments, and a thermoplastic binder in the form of a coating, fabric or fibers consisting entirely or essentially of solid thermoplastic polyethylene, ~~polypropylene or ethylene-propylene resin or a combination thereof~~ that softens or melts at a temperature below a temperature at which the backing and face yarn are damaged by heat and has flow properties ~~at about 100 to about 150°C~~ corresponding to an MI of about 2.2 to about ~~150~~ 105 g/10 min. as measured in accordance with ASTM D 1238; and a viscosity between approximately 230,000 and 4,881,000 cps at about 270°F with a shear rate of about 10 sec⁻¹ as measured in accordance with ASTM D 3835, wherein face yarn penetrates the backing and forms a pile surface comprising a plurality of tufts on one side of the backing and a plurality of stitches on an opposite, stitched side of the backing, and the thermoplastic binder is present on at least the stitched side of the backing;

applying to the stitched side of the tufted backing and in contact with a plurality of the stitches a stitch bind composition having a viscosity effective for coating or penetrating the stitches to contact the filaments thereof ranging from about 0.5 to 3000 cps and comprising water and an organic polymer component that bonds filaments of the stitches on removal of the water, wherein the stitch bind composition is applied in an amount effective to provide about 0.2 to about 3 ounces of the organic polymer component or a residue thereof per square yard of the stitched side;

heating the tufted backing in contact with the stitch bind composition to remove the water without damaging the tufted backing;

heating the binder to soften or melt the thermoplastic resin without damaging the tufted backing; and

cooling the binder with the softened or melted resin thereof in contact with the stitched side of the tufted backing to solidify the resin.

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27. (Currently Amended) A process for manufacturing carpets comprising steps that comprise

providing a tufted primary backing having a pile side comprising face yarn tufts and an opposite side having a plurality of stitches of face yarn;

applying to a plurality of the stitches a stitch bind composition having a viscosity effective for coating or penetrating the stitches to contact the filaments thereof ranging from about 0.5 to 3000 cps and comprising an aqueous liquid component that boils or vaporizes at a temperature such that it can be removed by heating below a temperature at which the tufted backing is damaged by heat and an organic polymer component that bonds filaments of the stitches on removal of the aqueous liquid component, wherein the stitch bind composition is applied in an amount effective to provide about 0.2 to about 3 ounces of the organic polymer component or a residue thereof per square yard of the stitched side;

contacting the tufted primary backing, an additional backing and a thermoplastic binder consisting entirely or essentially of a thermoplastic polyethylene, ~~polypropylene or ethylene propylene copolymer resin or combination thereof~~ having flow properties at ~~about 100 to about 150°C~~ corresponding to an MI of about 2.2 to about ~~150~~ 105 g/10 min. as measured in accordance with ASTM D 1238; and a viscosity between approximately 230,000 and 4,881,000 cps at about 270°F with a shear rate of about 10 sec⁻¹ as measured in accordance with ASTM D 3835 and that softens or melts at a temperature below a temperature at which the tufted primary backing and the additional backing are damaged by heat or that, when softened or melted, can contact the tufted primary backing and the additional backing without such damage, to form an intermediate structure having the thermoplastic binder disposed between the stitched side of the tufted primary backing and the additional backing;

heating the tufted primary backing or the intermediate structure after application of the stitch bind composition to remove the aqueous liquid component without damaging the tufted primary or additional backing;

heating the thermoplastic binder to soften or melt the thermoplastic resin without damaging the tufted backing or the additional backing; and

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cooling the intermediate structure with the thermoplastic resin in softened or melted form to solidify the resin.

28-33. (cancelled)

34. (Previously Presented) The process of claim 25 further comprising an additional step comprising contacting the stitched side of the tufted backing, the thermoplastic binder and an additional backing with the binder disposed between the stitched side and the additional backing such that the additional backing is bonded to the stitched side on cooling of the binder to solidify the resin.

35. (Previously Presented) The process of claim 34 wherein the additional backing comprises a secondary backing woven from polypropylene tapes or yarns.

36. (Previously Presented) The process of claim 34 wherein the additional backing comprises a thermoplastic binder.

37. (Previously Presented) The process of claim 34 wherein the additional backing comprises a fabric woven from polypropylene tapes or yarns with a thermoplastic binder in the form of a nonwoven fabric or fibers comprising a thermoplastic resin needled thereto.

38. (Previously Presented) The process of claim 25 wherein the stitch bind composition has a viscosity of about 1.5 to 400 cps.

39. (Previously Presented) The process of claim 26 wherein the thermoplastic binder is a nonwoven fabric needled to the backing.

40. (Previously Presented) The process of claim 39 wherein the backing comprises a fabric woven from tapes comprising polypropylene.

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41. (Previously Presented) The process of claim 26 wherein the stitch bind composition has a viscosity of about 1 to about 1200 cps.

42. (Previously Presented) The process of claim 27 wherein the tufted primary backing comprises a fabric woven from tapes comprising polypropylene.

43. (Previously Presented) The process of claim 42 wherein the additional backing comprises a secondary backing fabric woven from polypropylene tapes or yarns.

44. (Previously Presented) The process of claim 43 wherein the viscosity of the stitch bind composition is about 1.5 to 400 cps.

45. (Previously Presented) The process of claim 27 wherein the additional backing comprises a secondary backing fabric woven from polypropylene tapes or yarns.

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